

Dr. Duke's Phytochemical and Ethnobotanical Databases

Chemicals found in *Helianthus annuus*

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	(-)-ENT-KAUR-16-EN-19-OIC-ACID	Stem				--
0	(-)-ENT-KAUR-16-EN-19-OIC-ACID-THUJANOL-ESTER	Flower				--
0	(-)-ENT-KAURAN-16-BETA-19-DIOL	Flower				--
0	(-)-ENT-KAURAN-16-BETA-OL	Flower				--
3	(-)-KAUR-16-EN-19-OIC-ACID	Flower				--
0	(-)-TRACHYLOBAN-19-OIC-ACID-THUJANOL-ESTER	Flower				--
0	1,2-ANHYDRIDO-4,5-DIHYDO-NIVEUSIN-A	Leaf		161.0		--
0	1,2-ANHYDRIDO-NIVEUSIN-A	Leaf		228.0		--
67	1,8-CINEOLE	Flower				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
0	1-METHOXY-4,5-DIHYDO-NIVEUSIN-A	Leaf		207.0		--
0	1-O-METHYL-4,5-DIHYDO-NIVEUSIN-A	Leaf		207.0		--
0	1-O-METHYL-HEMI-KETAL-4,5-DIHYDO-NIVEUSIN-A	Leaf		207.0		--
0	12N-TRICOSANE	Seed				--
0	15-BETA-HYDROXY-TRACHYLOBAN-19-OIC-ACID-METHYL-ESTER	Flower				--
0	15-HYDROXY-3-DEHYDRO-DEOXY-FRUTICIN	Leaf		78.0		--
0	15-HYDROXY-DEOXY-3-DEHYDRO-FRUTICIN	Leaf				--
0	17-HYDROXY-ENT-ISOKAUR-15(16)-EN-19-OIC-ACID	Leaf				--
0	2,4-METHYLENE-CHOLESTEROL	Pollen Or Spore				--
0	2-METHYL-PROPAN-1-OL	Flower				--
0	23-DEHYDRO-BETA-SITOSTEROL	Pollen Or Spore				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	23-DEHYDRO-CAMPESTANOL	Pollen Or Spore				--
0	23-DEHYDRO-CHOLESTEROL	Pollen Or Spore				--
0	24-ETHYL-24(25)-DEHYDROLATHOSTEROL	Seed				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
0	24-ETHYL-CHOLESTEROL	Seed				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
0	24-ETHYL-TRANS-22-DEHYDROCHOLESTEROL	Seed				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
0	24-ETHYLLATHOSTEROL	Seed				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
0	24-METHYL-CHOLESTEROL	Seed				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
0	24-METHYL-LATHOSTEROL	Seed				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
0	24-METHYL-TRANS-22-DEHYDROCHOLESTEROL	Seed				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
0	24-METHYLENE-25-METHYLCHOLESTEROL	Seed				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	24-METHYLENE-CHOLESTANOL	Pollen Or Spore				--
0	24-METHYLENE-CYCLOARTENOL	Plant				Stitt, Paul. Why George should eat broccoli.
0	24Z-ETHYLIDENECHOLESTEROL	Seed				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
0	24Z-ETHYLIDENELATHOSTEROL	Seed				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
0	25-DEHYDRO-SITOSTANOL	Pollen Or Spore				--
0	28-ISOAVENASTEROL	Seed				--
0	3-ETHOXY-NIVEUSIN-B	Leaf		11.0		--
0	3-ETHOXYNIVEUSIN-A	Leaf				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
0	3-HYDROXY-3,4-SECO-DAMMARA-4,24-DIENE	Pollen Or Spore		79.0		--
0	3-HYDROXY-DEOXY-3-DEHYDRO-FRUTICIN	Leaf				--
0	3-KETO-15-HYDROXY-DEOXY-FRUTICIN	Shoot		45.0		--
0	4,5-DIHYDRO-8,9-DEHYDRO-THEASPIRONE	Flower				--
0	4,5-DIHYDRO-NIVEUSIN-A	Leaf				--
0	5-DEHYDRO-AVENASTEROL	Seed				--
0	6-ALPHA,7-ALPHA-17-TETRAHYDROXY	Plant				--
0	7,24-STIGMASTADIEN-3BETA-OL	Plant				J.S. Glasby Dict.Pls Containing 2ndary Metabolite. 1991.
0	7-ALPHA,16-BETA-17-TRIHYDROXY	Plant				--
0	7-DEHYDRO-AVENASTEROL	Seed				--
0	ABSCISIC-ACID	Seed				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	ACETIC-ACID-ETHYL-ESTER	Flower				--
0	ACETOIN	Flower				--
1	ACONITIC-ACID	Leaf				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
0	AGROPHYLLIN-A	Leaf				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
0	AGROPHYLLIN-B	Leaf				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
3	ALANINE	Seed	11170.0	11800.0	0.3494340343120688	USDA's Ag Handbook 8 and sequelae)
0	ALL-TRANS-LUTEIN-EPOXIDE	Flower				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
10	ALPHA-AMYRIN	Seed				--
28	ALPHA-PINENE	Plant				Stitt, Paul. Why George should eat broccoli.
13	ALPHA-TERPINENE	Flower				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
23	ALPHA-TERPINEOL	Flower				--
32	ALPHA-TOCOPHEROL	Oil		622.0	0.2186734260494272	--
2	ANNUITHRIN	Shoot		40.0		--
2	ANNUITHRIN	Leaf				Chemical Constituents of Oriental Herbs (3 diff. books)
0	ARABINOSE	Seed				--
14	ARGININE	Seed	24030.0	82000.0	2.428816543007727	USDA's Ag Handbook 8 and sequelae)

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
2	ARGOPHYLLIN-A	Leaf				--
2	ARGOPHYLLIN-B	Leaf		176.0		--
1	ARNIDIOL	Flower				--
0	ARTEMISIA-KETONE	Flower				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
0	ASH	Seed	26000.0	49300.0	0.04270681663676372	--
3	ASPARTIC-ACID	Seed	24460.0	25800.0	0.2850604453864925	USDA's Ag Handbook 8 and sequelae)
0	AYAPIN	Root				--
1	BEHENIC-ACID	Seed				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
1	BEHENIC-ACID	Fruit				--
0	BENZOIC-ACID-PENTYL	Plant				--
0	BENZOIC-ACID-PENTYL-ESTER	Flower				--
9	BETA-AMYRIN	Seed				--
53	BETA-CAROTENE	Seed	0.0	0.3	-0.41055580088060895	USDA's Ag Handbook 8 and sequelae)
13	BETA-PINENE	Flower				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
47	BETA-SITOSTEROL	Seed	3490.0	3510.0	0.7159177552484736	Spiller, G. A. 1996 (Spiller, G. A. Ed. 1996. CRC Handbook of Lipids in Human Nutrition. CRC Press. Boca Raton, FL. 233 pp.)
35	BORNEOL	Flower				--
0	BORNEOL-ACETATE	Flower				--
0	BRASSICASTEROL	Pollen Or Spore				--
3	BRASSINOLIDE	Pollen Or Spore				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	BREIN	Shoot				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
102	CAFFEIC-ACID	Seed	1600.0	1800.0	0.9502356432760076	--
102	CAFFEIC-ACID	Pollen Or Spore		4.0		--
28	CALCIUM	Seed	917.0	1225.0	-0.5365417460978219	USDA's Ag Handbook 8 and sequelae)
0	CALENDULADIOL	Seed				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
0	CAMPEST-7-EN-BETA-OL	Seed				--
2	CAMPESTEROL	Seed	750.0	770.0	0.9683913917867137	Spiller, G. A. 1996 (Spiller, G. A. Ed. 1996. CRC Handbook of Lipids in Human Nutrition. CRC Press. Boca Raton, FL. 233 pp.)
9	CAMPHENENE	Essential Oil				--
0	CAMPHOLENAL	Flower				--
41	CAMPHOR	Flower				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
3	CAPRIC-ACID	Seed				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
0	CAPROIC-ACID-METHYL-ESTER	Flower				--
0	CARBOHYDRATES	Seed	133000.0	213000.0	-1.233601396943731	--
0	CASTASTERONE	Pollen Or Spore				--
1	CELLULOSE	Fruit				--
1	CELLULOSE	Seed				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
1	CEPHALIN	Seed	615.0	1230.0	-0.7370340011227791	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
77	CHLOROGENIC-ACID	Seed	1900.0	28000.0	0.33366434629149755	--
1	CHOLESTEROL	Seed		1500.0	1.0	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
20	CHOLINE	Seed		1200.0	-0.4445983553028156	--
0	CILIARIC-ACID	Leaf				--
18	CINNAMIC-ACID	Seed				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
0	CIS-13'-LUTEIN-EPOXIDE	Flower				--
0	CIS-13-VIOLAXANTHIN	Flower				--
0	CIS-5,6-LUTEIN-EPOXIDE	Flower				--
0	CIS-9'-LUTEIN	Flower				--
0	CIS-XANTHOXIN	Flower				--
53	CITRAL	Flower				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
23	CITRIC-ACID	Seed		1900.0	-1.228406167330634	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
12	COPPER	Seed	15.0	19.0	0.3796476594234794	USDA's Ag Handbook 8 and sequelae)
2	CRYPTOXANTHIN	Flower				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
1	CUMIN-ALCOHOL	Flower				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	CUTIN	Flower				--
7	CYCLOARTENOL	Seed				--
13	CYSTEINE	Seed	4510.0	16000.0	2.5164597908165307	--
0	DAUCIC-ACID	Plant				Chemical Constituents of Oriental Herbs (3 diff. books)
5	DAUCOSTEROL	Seed				--
0	DECA-2,5-DIEN-1-AL	Flower				--
1	DELTA-7-AVENASTEROL	Seed				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
1	DELTA-CADINOL	Flower				--
4	DELTA-TOCOPHEROL	Oil				--
0	DEMETHOXY-ENCECALIN	Root		10.0		--
0	DEMETHOXY-ENCECALOL	Root		19.0		--
0	DIHYDRO-PHASEIC-ACID	Seed				--
0	DIOXINDOLE-3-ACETIC-ACID	Seed				--
0	ECHINOCYSTIC-ACID	Flower				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
0	ENT-15-BEYERAN-19-OIC-ACID	Flower				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
0	ENT-ATISAN-16-ALPHA-OL	Flower				--
0	ENT-ATISAN-16-BETA-OL	Flower				--
0	ENT-ISO-KAUR-15(16)-EN-19-OIC-ACID	Leaf				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
0	ENT-KAUR-16-EN-19-AL	Leaf				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	ENT-KAUR-16-EN-19-OIC-ACID	Stem				--
0	ENT-KAUR-16-EN-19-OIC-ACID-THUJANOL-ESTER	Flower				--
0	ENT-KAURAN-16-BETA-19-DIOL	Flower				--
0	ENT-KAURAN-16-BETA-OL	Flower				--
0	ENT-TRACHYLOBAN-19-AL	Flower				--
0	EO	Flower				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
0	ERYTHRODIOL	Shoot				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
76	EUGENOL	Flower				--
2	FARADIOL	Flower		7800.0		--
0	FAT	Seed	222000.0	523800.0	1.3611505908440047	--
61	FERULIC-ACID	Pollen Or Spore	2.0	3.0		--
15	FIBER	Seed	37550.0	323000.0	1.486226562630823	--
8	FRUCTOSE	Flower				--
7	FUMARIC-ACID	Leaf				--
0	GADOLEIC-ACID	Seed	480.0	505.0	-0.657058506074547	USDA's Ag Handbook 8 and sequelae)
1	GALACTOSE	Flower				--
0	GALACTURONIC-ACID	Flower				--
14	GAMMA-TOCOPHEROL	Oil		27.0	-1.241582556791874	--
0	GERANIOL-ACETONE	Flower				--
0	GIBBERELLINS	Seed				--
7	GLUCOSE	Seed				--
0	GLUTAMINIC-ACID	Seed	55790.0	58900.0		USDA's Ag Handbook 8 and sequelae)

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	GLYCEROL-ALPHA-MONOPALMITATE	Pollen Or Spore		102.0		--
12	GLYCINE	Seed	14610.0	15400.0	0.6430760701183263	USDA's Ag Handbook 8 and sequelae)
0	GLYCOLATE-OXIDASE	Cotyledon				--
54	GOSSYPOL	Seed		10.0	-0.5512186425263101	--
6	GRANDIFLORIC-ACID	Flower				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
1	HELIANGIN	Plant				Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
1	HELIANTHOSIDE-A	Flower				--
0	HELIANTHOSIDES	Flower				--
0	HELIANTRIOL-B	Flower		700.0		--
0	HELIANTRIOL-C	Flower		100.0		--
0	HELIANTRIOL-F	Flower		5.0		--
0	HELIANTRIOLS	Plant				J.S. Glasby Dict.Pls Containing 2ndary Metabolite. 1991.
0	HEMICELLULOSE	Flower				--
0	HEX-TRANS-2-EN-1-AL	Flower				--
3	HEXAHYDRO-2H-AZEPIN-2-ONE	Sprout Seedling				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
0	HEXAN-1-AL	Seed				--
7	HISPIDULIN	Plant				Stitt, Paul. Why George should eat broccoli.
18	HISTAMINE	Tissue Culture				--
7	HISTIDINE	Seed	6320.0	20000.0	3.688881333268414	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
3	HYMENOXIN	Plant				Stitt, Paul. Why George should eat broccoli.
12	IODINE	Seed		0.042	-0.2745141613777973	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
6	IRON	Seed	60.0	70.0	-0.37538951089484696	--
4	ISOCHLOROGENIC-ACID	Plant				--
4	ISOFERULIC-ACID	Seed	1400.0	1700.0	1.4142093214695879	Jim Duke's personal files.
0	ISOFUCOSTEROL	Pollen Or Spore				--
3	ISOLEUCINE	Seed	11390.0	46500.0	4.594732547635374	--
28	ISOLIQUIRITIGENIN	Plant				Stitt, Paul. Why George should eat broccoli.
1	ISOMENTHOL	Flower				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
0	JASMONIC-ACID	Seed				--
3	KAUR-16-EN-19-OIC-ACID	Flower				--
0	KILOCALORIES	Plant		6022.0	2.506936719352974	--
8	LACTIC-ACID	Leaf				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
20	LECITHIN	Seed	385.0	2300.0	-0.6765969690609044	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
0	LEUCENOPINE	Tissue Culture				--
0	LEUCENOPINE-LACTAM	Tissue Culture				--
2	LEUCINE	Seed	16590.0	35500.0	1.7630018192536456	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
13	LIGNIN	Pericarp	250000.0	300000.0		Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
1	LIGNOCERIC-ACID	Fruit				--
1	LIGNOCERIC-ACID	Seed				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
60	LIMONENE	Flower				--
0	LINALOL	Flower				--
53	LINALOOL	Flower				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
7	LINALYL-ACETATE	Flower				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
27	LINOLEIC-ACID	Seed	89000.0	350000.0	2.0810011317954165	--
0	LINOLENIC-ACID	Seed	690.0	730.0	-0.5671181629291847	USDA's Ag Handbook 8 and sequelae)
2	LOLIOLIDE	Flower				--
21	LUPEOL	Shoot				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
15	LUTEIN	Flower				--
0	LUTEIN-EPOXIDE	Flower				--
4	LYSINE	Seed	9370.0	9900.0	-0.29781359908921706	--
65	MAGNESIUM	Seed	3540.0	5176.0	0.8810173298853301	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
15	MALIC-ACID	Leaf				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
1	MALONIC-ACID	Leaf				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
2	MALTOSE	Flower				--
14	MANGANESE	Seed	20.0	21.0	-0.40511016640256897	USDA's Ag Handbook 8 and sequelae)
0	MELOBIOSSE	Flower				--
63	MENTHOL	Flower Essent. Oil	235000.0	310000.0		--
15	METHIONINE	Seed	4940.0	20500.0	4.1793275654576725	--
3	METHYL-ACETATE	Flower				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
13	MUFA	Seed	94620.0	100000.0	-0.06817898704459366	--
6	MYRISTIC-ACID	Seed	500.0	900.0	-0.2842214392424068	--
5	MYRTENAL	Flower				--
0	N-DOCOSANE	Seed				--
0	N-EICOSANE	Seed				--
0	N-HENEICOSANE	Seed				--
3	N-HENTRIACONTANE	Seed				--
0	N-HEPTACOSANE	Seed				--
0	N-HEPTADECANE	Seed				--
2	N-HEXACOSANE	Seed				--
0	N-HEXADECANE	Seed				--
1	N-NONACOSANE	Seed				--
0	N-NONADECANE	Seed				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	N-OCTADECANE	Seed				--
0	N-PENTACOSANE	Seed				--
0	N-TETRACOSANE	Seed				--
0	N-TRIDEC-2-ONE	Flower				--
2	NEO-CHLOROGENIC-ACID	Seed				--
39	NIACIN	Seed	45.0	48.0	0.1530815697418368	--
0	NIVEUSIN-B	Leaf				--
2	NIVEUSIN-C	Leaf		114.0		Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
0	NUCLEIN	Seed		5100.0		ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
0	O-HYDROXYBENZOIC-ACID	Seed				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
64	OLEANOLIC-ACID	Flower				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
18	OLEIC-ACID	Seed	36000.0	178000.0	0.48416430072452843	--
25	P-COUMARIC-ACID	Seed	900.0	1100.0	2.709983056618278	Jim Duke's personal files.
25	P-COUMARIC-ACID	Pollen Or Spore		11.0		--
16	P-CYMENE	Flower				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
13	P-HYDROXY-BENZOIC-ACID	Seed				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
13	PALMITIC-ACID	Seed	14250.0	32000.0	-0.039337218532970196	--
2	PALMITOLEIC-ACID	Seed	490.0	515.0	-0.28610525841718454	USDA's Ag Handbook 8 and sequelae)
24	PECTIN	Plant		110000.0	1.4120278901082428	Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
2	PECTOLINARIGENIN	Plant				Stitt, Paul. Why George should eat broccoli.
0	PENTAN-2-ONE	Seed				--
0	PENTOSANS	Pericarp	240000.0	290000.0		Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
0	PERILLYL-ACETATE	Flower				--
2	PHENYL-ACETALDEHYDE	Flower				--
7	PHENYLALANINE	Seed	11690.0	48000.0	4.353920008819304	--
2	PHOSPHATIDYL-CHOLINE	Seed				--
0	PHOSPHATIDYL-ETHANOLAMINE	Seed				--
0	PHOSPHATIDYL-SERINE	Seed				--
4	PHOSPHORUS	Seed	6930.0	7450.0	0.5540577574564426	--
5	PHYLLOQUINONE	Seed Oil		0.06	-1.0587137637796051	--
0	PHYTATE	Seed	16000.0	17030.0	0.5838864845748781	--
9	PHYTIC-ACID	Seed				--
0	PHYTIN	Seed				ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
2	PHYTOSTEROLS	Seed	5340.0	5642.0	0.8999907123518872	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
14	POTASSIUM	Seed	6890.0	7280.0	-0.46522595774426684	--
0	PROLINE	Seed	11820.0	12500.0	0.2287059383143203	--
0	PROPOVANILLONE	Flower				--
0	PROTEIN	Seed	135000.0	248615.0	0.13182207877269972	--
4	PUFA	Seed	327350.0	345900.0	1.828849417347788	--
176	QUERCETIN	Leaf	60.0	210.0	-0.34863362562221356	--
176	QUERCETIN	Flower	100.0	400.0	-0.4773236748162204	--
2	QUERCETIN-3'-GLUCOSIDE	Flower				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
0	QUERCETIN-7-O-BETA-D-GLUCOSIDE	Pollen Or Spore		22.0		--
1	QUINIC-ACID	Seed				--
1	RAFFINOSE	Pericarp				--
0	RHAMNOSE	Seed				--
15	RIBOFLAVIN	Seed	2.0	3.0	-0.20090831129253928	Laferriere, J.E., 1988, Nutricomp Program, Nutricomp Database; reviewed in J. Ethnobiology 9(1):27-29.
0	RUBBER	Shoot		2600.0		--
0	RUBBER	Leaf		5500.0		--
1	RUBIXANTHIN	Flower				Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
5	SABINENE	Flower				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
5	SABINOL	Flower				--
7	SALICYLATES	Seed		1.0	-0.33481239090631587	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
44	SCOPOLETIN	Plant				Stitt, Paul. Why George should eat broccoli.
1	SERINE	Seed	10750.0	11400.0	0.15824437140006012	--
0	SFA	Seed	51950.0	54900.0	-0.03900725043781273	--
14	SHIKIMIC-ACID	Seed				--
9	SINAPIC-ACID	Seed	4800.0	5700.0	1.7320468327716805	Jim Duke's personal files.
1	SODIUM	Seed	30.0	32.0	-0.6649190286723775	--
10	SQUALENE	Seed				ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
1	STACHYOSE	Seed				--
8	STEARIC-ACID	Seed	9000.0	28000.0	0.04211488009527745	--
0	STIGMAST-7-EN-3-BETA-OL	Seed				--
12	STIGMASTEROL	Seed	610.0	650.0	0.2956718243575674	Spiller, G. A. 1996 (Spiller, G. A. Ed. 1996. CRC Handbook of Lipids in Human Nutrition. CRC Press. Boca Raton, FL. 233 pp.)
7	SUCCINIC-ACID	Leaf				--
14	SUCROSE	Flower				--
14	SULFUR	Seed	2574.0	4880.0	1.3264976870978602	--
6	SYRINGIC-ACID	Seed				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
0	TARAXANTHIN	Flower				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
2	TARAXASTEROL	Shoot				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
6	TARTARIC-ACID	Seed		1900.0		ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
0	TERPINEN-1-EN-4-OL	Flower				--
5	TERPINYL-ACETATE	Flower				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
31	THIAMIN	Seed	22.0	24.0	4.155129863917932	--
4	THREONINE	Seed	9280.0	9805.0	0.37302144205015586	--
0	TIGITANIN-A	Leaf				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
93	TOCOPHEROL	Seed		34000.0	2.641805493100346	Laferriere, J.E., 1988, Nutricomp Program, Nutricomp Database; reviewed in J. Ethnobiology 9(1):27-29.
3	TRACHYLOBAN-19-OIC-ACID	Flower				--
0	TRACHYLOBAN-19-OIC-ACID-THUJANOL-ESTER	Flower				--
0	TRANS-5,6-LUTEIN-EPOXIDE	Flower				--
0	TRANS-ABSCISIC-ACID	Seed				--
0	TRANS-CINNAMIC-ACID	Seed	500.0	700.0		Jim Duke's personal files.
29	TRYPTOPHAN	Seed	3480.0	15900.0	4.288467497944186	--
8	TYROSINE	Seed	6660.0	7035.0	-0.16359025398761914	--
0	URONIC-ACID	Pericarp	65000.0	77600.0		Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
3	VALINE	Seed	13150.0	50000.0	4.678652580685171	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
28	VANILLIN	Seed				Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
28	VANILLIN	Root		0.9		--
28	VANILLIN	Fruit				--
5	VERBENONE	Flower				--
2	VIOLAXANTHIN	Flower				--
0	WATER	Seed	53600.0	72900.0	-0.5936756731552985	--
0	WAX	Pericarp	4200.0	4600.0	-1.0	Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
77	ZINC	Seed	46.0	54.0	0.2517628230210634	--